

**Orangeline Development Authority
Orangeline High Speed Maglev
Milestone 10 - Financial Plan Supplement**

Financial Model 2h (2007-2062)

April 2, 2008

Palmdale-OC Line Project Summary

2007 dollars

Project Cash Surplus	\$17,276,873,265
Operating Reserves	\$1,484,203,996
Station-area Improvements and Feeder Services	\$15,662,133,533
Investor Interest Earnings	\$17,440,820,412
User Cost Savings (Compared to Owning/Driving a Car)	\$1,521,514,726
User Travel Delay Savings (Compared to Driving a Car)	\$27,380,486,857
Total Project Benefits	\$72,721,826,749
Project Cost (including vehicle replacement in year 25)	\$16,810,221,511
Benefit/Cost Ratio (Without Value of Emission Savings)	4.3
Emission Savings	\$4,402,967,839
Benefit/Cost Ratio (with Emission Benefits)	4.6
Reduction in Gasoline Consumption (gallons)	1,862,945,256
Annual Reduction in NOx and CO ₂ Emissions (tons in 2027)	544,408

Project Description

Orangeline High Speed Maglev from Palmdale in northern Los Angeles County to Orange County line

	Length (miles)	Cost	Schedule
Preconstruction Phase	80	\$147,841,956	2007 - 2009
Construction Phase			
a	20	\$3,204,666,667	2010 - 2012
b	25	\$4,985,037,037	2012 - 2015
c	35	\$5,906,556,741	2014 - 2017
	Average Speed (mph)	Peak Period Service Frequency (minutes)	Off-Peak Period Service Frequency (minutes)
Operation Phase	90	5	10

The project is fully described in Project Milestone Reports and summarized in Milestone 10 - Financial Plan, which are available for viewing and downloading at www.orangeline.calmaglev.org

Year	Debt					Revenue					Construction, Operating & Reserve Expenses					Interest			Operating Debt / Surplus		Debt
	Beginning debt balance	Daily Passenger Trips	Annual Passenger Trips	Average Fare Received	Annual Passenger Fare Revenues	Annual Freight Concessions Revenues	Annual Other Revenues	Total Annual Revenues	Annual Construction Expenses (debt)	System O&M Expense annual escalation 3%	Station-area Improvements & Feeder Services Operating Expenses 30%	Reserves Operating Expense 3%	Annual Operating Expenses Sum	Interest	Interest Expense	Interest Earnings	Revenue minus Expenses (debt)	Revenue minus Expenses (surplus)	Ending Debt/Balance		
2007	\$0			\$18.00					\$38,456,000				\$0	10.0%	\$0	\$0	-\$38,456,000	\$0	\$38,456,000		
2008	\$38,456,000			\$18.54					\$57,215,982				\$0	10.0%	\$3,845,900	\$0	-\$31,659,582	\$0	\$99,515,582		
2009	\$99,515,582			\$19.10					\$57,117,159				\$0	10.0%	\$9,951,558	\$0	-\$27,166,021	\$0	\$176,681,603		
2010	\$168,584,299			\$19.67					\$78,183,509				\$0	8.0%	\$13,326,744	\$0	-\$151,267,545	\$0	\$98,094,552		
2011	\$58,094,552			\$20.26					\$1,202,293,522				\$0	8.0%	\$76,647,564	\$0	-\$1,278,941,068	\$0	\$2,237,035,639		
2012	\$2,237,035,639			\$20.87					\$1,651,149,710	\$75,158,959			\$75,158,959	8.0%	\$176,862,851	\$0	-\$1,402,307,219	\$0	\$4,142,307,219		
2013	\$4,142,307,219	67,993	73,739	\$21.22	\$440,089,474	\$36,608,053	\$74,197,723	\$553,895,203	\$2,501,026,395	\$77,413,727	\$14,294,446	\$91,708,173	\$0	8.0%	\$331,384,578	\$0	-\$2,420,223,896	\$0	\$6,562,531,114		
2014	\$6,562,531,114	81,591	88,287	\$21.58	\$537,085,194	\$48,337,688	\$91,464,991	\$676,887,863	\$3,003,409,583	\$79,736,139	\$17,914,551	\$97,650,690	\$0	8.0%	\$525,002,489	\$0	-\$3,448,174,910	\$0	\$10,011,708,024		
2015	\$10,011,708,024	97,989	106,344	\$21.95	\$655,458,771	\$58,991,089	\$112,734,059	\$827,184,119	\$3,808,511,870	\$18,788,592	\$20,920,869	\$39,709,488	\$0	8.0%	\$600,336,482	\$0	-\$3,786,324,604	\$0	\$13,788,033,628		
2016	\$13,788,033,628	117,491	126,843	\$22.32	\$799,921,685	\$71,982,970	\$171,982,970	\$1,010,842,146	\$2,797,625,420	\$19,030,357	\$24,615,300	\$43,645,657	\$0	8.0%	\$1,103,842,481	\$0	-\$3,095,523,811	\$0	\$16,893,510,819		
2017	\$16,893,510,819	140,989	150,224	\$22.70	\$976,224,668	\$87,860,220	\$171,789,093	\$1,238,455,424	\$3,468,512,930	\$26,602,310	\$37,121,638	\$63,723,948	\$0	8.0%	\$1,351,484,305	\$0	-\$2,734,039,525	\$0	\$18,623,342,194		
2018	\$18,623,342,194	165,219	175,491	\$23.09	\$1,122,005,102	\$92,034,459	\$181,004,224	\$1,256,843,795	\$3,974,930,988	\$36,974,908	\$50,700,066	\$87,674,974	\$0	6.5%	\$1,210,517,243	\$0	-\$2,523,423,745	\$0	\$18,359,920,449		
2019	\$18,359,920,449	189,576	200,849	\$23.48	\$1,271,189,070	\$98,407,016	\$198,364,973	\$1,368,618,773	\$4,488,221,148	\$39,744,155	\$53,322,855	\$89,067,010	\$0	6.5%	\$1,230,143,891	\$0	-\$2,293,284,884	\$0	\$18,136,635,665		
2020	\$18,136,635,665	214,000	226,100	\$23.88	\$1,422,081,263	\$102,967,314	\$202,364,109	\$1,426,405,672	\$5,023,511,870	\$42,171,426	\$56,334,846	\$108,506,272	\$0	6.5%	\$1,247,733,502	\$0	-\$2,045,551,368	\$0	\$18,136,635,665		
2021	\$18,136,635,665	238,000	250,000	\$24.29	\$1,575,391,344	\$105,765,221	\$213,750,434	\$1,494,206,999	\$5,392,261,574	\$49,029,422	\$64,315,950	\$113,345,374	\$0	6.5%	\$1,262,980,567	\$0	-\$1,782,915,193	\$0	\$18,623,342,194		
2022	\$18,623,342,194	262,000	274,000	\$24.70	\$1,728,187,187	\$108,610,077	\$225,636,833	\$1,567,882,096	\$5,749,029,422	\$0	\$0	\$175,551,249	\$0	6.5%	\$1,275,551,249	\$0	-\$1,416,614,155	\$0	\$19,720,479,528		
2023	\$19,720,479,528	286,000	300,000	\$25.12	\$1,881,076,711	\$111,675,123	\$238,500,123	\$1,644,366,445	\$6,096,484,184	\$0	\$0	\$187,376,374	\$0	6.5%	\$1,087,376,374	\$0	-\$1,118,683,562	\$0	\$19,601,795,966		
2024	\$19,601,795,966	310,000	324,000	\$25.55	\$2,034,005,201	\$114,740,588	\$251,917,289	\$1,724,512,958	\$6,448,834,813	\$52,803,357	\$38,876,344	\$50,114,515	\$0	6.5%	\$1,081,657,277	\$0	-\$1,032,466,757	\$0	\$19,571,329,189		
2025	\$19,571,329,189	334,000	348,000	\$25.98	\$2,186,934,668	\$117,811,448	\$283,722,896	\$1,809,224,416	\$6,804,221,148	\$57,332,868	\$41,010,576	\$52,143,891	\$0	6.5%	\$1,074,906,513	\$0	-\$925,560,244	\$0	\$19,475,768,945		
2026	\$19,475,768,945	358,000	372,000	\$26.42	\$2,338,864,148	\$120,878,314	\$315,591,210	\$1,894,736,630	\$7,168,512,958	\$59,979,579	\$43,254,558	\$53,170,500	\$0	6.5%	\$1,065,238,779	\$0	-\$818,321,565	\$0	\$19,377,447,380		
2027	\$19,377,447,380	382,000	396,000	\$26.87	\$2,491,793,636	\$123,929,180	\$347,520,390	\$1,980,804,457	\$7,530,024,813	\$62,512,547	\$45,612,709	\$64,715,090	\$0	6.5%	\$1,052,405,757	\$0	-\$710,916,776	\$0	\$19,278,530,604		
2028	\$19,278,530,604	406,000	420,000	\$27.32	\$2,644,723,122	\$126,979,946	\$379,440,336	\$2,070,824,303	\$7,900,024,813	\$65,022,559	\$48,022,808	\$83,820,582	\$0	6.5%	\$1,039,143,158	\$0	-\$604,773,620	\$0	\$19,179,756,984		
2029	\$19,179,756,984	430,000	444,000	\$27.77	\$2,799,652,608	\$130,030,812	\$411,350,312	\$2,161,855,115	\$8,268,024,813	\$67,530,527	\$50,431,233	\$102,931,075	\$0	6.5%	\$1,026,002,299	\$0	-\$496,242,545	\$0	\$19,080,514,439		
2030	\$19,080,514,439	454,000	468,000	\$28.22	\$2,955,582,094	\$133,081,678	\$443,260,294	\$2,252,885,932	\$8,637,024,813	\$69,039,513	\$52,834,167	\$122,865,270	\$0	6.5%	\$1,012,836,650	\$0	-\$386,706,770	\$0	\$18,981,807,669		
2031	\$18,981,807,669	478,000	492,000	\$28.67	\$3,112,511,580	\$136,132,544	\$475,170,270	\$2,344,917,049	\$9,010,024,813	\$70,548,486	\$55,234,100	\$142,799,370	\$0	6.5%	\$1,000,663,101	\$0	-\$277,177,919	\$0	\$18,883,630,750		
2032	\$18,883,630,750	502,000	516,000	\$29.12	\$3,270,441,066	\$139,183,410	\$507,080,246	\$2,436,946,566	\$9,390,024,813	\$72,057,465	\$57,634,567	\$162,733,937	\$0	6.5%	\$988,495,552	\$0	-\$167,742,627	\$0	\$18,786,888,123		
2033	\$18,786,888,123	526,000	540,000	\$29.57	\$3,429,370,552	\$142,234,276	\$539,090,222	\$2,530,980,882	\$9,770,024,813	\$73,564,447	\$59,820,046	\$182,668,904	\$0	6.5%	\$976,327,003	\$0	-\$57,213,524	\$0	\$18,692,674,599		
2034	\$18,692,674,599	550,000	564,000	\$30.02	\$3,589,300,038	\$145,285,142	\$571,000,198	\$2,626,021,418	\$10,150,024,813	\$75,071,426	\$62,006,529	\$202,600,372	\$0	6.5%	\$964,160,474	\$0	-\$46,703,425	\$0	\$18,603,971,174		
2035	\$18,603,971,174	574,000	588,000	\$30.47	\$3,749,229,524	\$148,336,008	\$602,910,174	\$2,718,062,494	\$10,530,024,813	\$76,578,405	\$64,191,011	\$222,540,840	\$0	6.5%	\$952,000,945	\$0	-\$35,893,476	\$0	\$18,515,077,698		
2036	\$18,515,077,698	598,000	612,000	\$30.92	\$3,909,159,010	\$151,386,874	\$634,820,150	\$2,810,103,020	\$10,910,024,813	\$78,085,384	\$66,375,502	\$242,481,308	\$0	6.5%	\$939,831,416	\$0	-\$25,083,477	\$0	\$18,426,994,221		
2037	\$18,426,994,221	622,000	636,000	\$31.37	\$4,069,088,496	\$154,437,740	\$666,730,126	\$2,900,143,546	\$11,290,024,813	\$79,592,363	\$68,560,591	\$262,421,776	\$0	6.5%	\$927,661,887	\$0	-\$14,273,478	\$0	\$18,339,720,745		
2038	\$18,339,720,745	646,000	660,000	\$31.82	\$4,229,017,982	\$157,488,606	\$698,640,102	\$2,990,184,072	\$11,670,024,813	\$81,099,342	\$70,745,680	\$282,362,244	\$0	6.5%	\$915,492,358	\$0	-\$3,463,479	\$0	\$18,252,257,269		
2039	\$18,252,257,269	670,000	684,000	\$32.27	\$4,388,947,468	\$160,539,472	\$730,550,078	\$3,080,224,608	\$12,050,024,813	\$82,606,321	\$72,930,769	\$302,302,712	\$0	6.5%	\$903,322,829	\$0	-\$2,453,480	\$0	\$18,165,803,793		
2040	\$18,165,803,793	694,000	708,000	\$32.72	\$4,548,876,954	\$163,590,338	\$762,460,054	\$3,170,264,144	\$12,430,024,813	\$84,113,300	\$75,115,858	\$322,243,180	\$0	6.5%	\$891,153,300	\$0	-\$1,443,481	\$0	\$18,079,322,317		
2041	\$18,079,322,317	718,000	732,000	\$33.17	\$4,708,806,440	\$166,641,204	\$794,370,030	\$3,260,304,670	\$12,810,024,813	\$85,620,279	\$77,300,947	\$342,183,648	\$0	6.5%	\$878,982,771	\$0	-\$44,482	\$0	\$17,992,839,841		
2042	\$17,992,839,841	742,000	756,000	\$33.62	\$4,868,735,926	\$169,692,070	\$826,280,006	\$3,350,344,196	\$13,190,024,813	\$87,129,258	\$79,486,036	\$362,124,116	\$0	6.5%	\$866,813,242	\$0	-\$144,483	\$0	\$17,907,356,365		
2043	\$17,907,356,365	766,000	780,000	\$34.07	\$5,028,665,412	\$172,742,936	\$858,190,082	\$3,440,384,722	\$13,570,024,813	\$88,638,237	\$81,671,125	\$382,064,584	\$0	6.5%	\$854,643,713	\$0	-\$144,484	\$0	\$17,822,871,889		
2044	\$17,822,871,889	790,000	804,000	\$34.52	\$5,188,594,898	\$175,793,802	\$890,100,058	\$3,530,424,248	\$13,950,024,813	\$90,147,216	\$83,856,214	\$402,005,052	\$0	6.5%	\$842,474,184	\$0	-\$144,485	\$0	\$17,738,386,413		
2045	\$17,738,386,413	814,000	828,000	\$34.97	\$5,348,524,384	\$178,844,668	\$922,010,034	\$3,620,463,774	\$14,330,024,813	\$91,656,195	\$86,040,293	\$421,944,520	\$0	6.5%	\$830,304,655	\$0	-\$144,486	\$0	\$17,653,900,937		
2046	\$17,653,900,937	838,000	852,000	\$35.42	\$5,508,453,870	\$181,895,534	\$953,920,010	\$3,710,503,300	\$14,710,024,813	\$93,165,174	\$88,225,272	\$441,884,968	\$0	6.5%	\$818,135,126	\$0	-\$144,487	\$0	\$17,569,415,461		
2047	\$17,569,415,461	862,000	876,000	\$35.87	\$5,668,383,356	\$184,946,400	\$985,830,086	\$3,800,542,826	\$15,090,024,813	\$94,674,153	\$90,409,351	\$461,825,416	\$0	6.5%	\$806,064,597	\$0	-\$144,488	\$0	\$17,484,930,985		
2048	\$17,484,930,985	886,000	900,000	\$36.32	\$5,828,312,842	\$187,997,266	\$1,017,740,062	\$3,890,582,352	\$15,470,024,813	\$96,183,132	\$92,600,430	\$481,765,864	\$0	6.5%	\$794,094,128	\$0	-\$144,489	\$0	\$17,400,446,509		
2049	\$17,400,446,509	910,000	924,000	\$36.77	\$5,988,242,328	\$191,048,132	\$1,049,650,														

Calculations for Comparing Maglev and Auto Commuting Costs and travel time savings

	Freeway Average Trip Length 30.00%	91 Express Lane Baseline Average Trip Length	Auto Access Trips 70.00% auto access	Travel Time Savings	Year	Percent Walk Access 5.0%	Walk Access Users		Auto Access Users		Total	FTA Value of Time Savings \$45.94 per hour
							Cost Savings per year walk access	Delay Savings per year walk access	Cost Savings per year auto access	Delay Savings per year auto access		
Maglev cost												
Daily one-direction trips	189,478	189,478	189,478	189,478	2013	14.63%	\$15,996,136	\$26,455,669	-\$102,473,970	\$154,372,888	-\$86,477,834	\$433,988,536
Daily users (making two-direction trips)	94,739	94,739	94,739	94,739	2014	15.40%	\$20,205,646	\$33,417,887	-\$121,859,617	\$183,576,581	-\$101,653,972	\$520,786,243
Annual Ridership (Daily times 305 days per year)	57,790,790	57,790,790	57,790,790	57,790,790	2015	16.21%	\$42,211,815	\$67,202,921	-\$244,300,513	\$375,181,307	-\$119,307,203	\$624,943,492
Annual round trips	28,895,395	28,895,395	28,895,395	16,234,748	2016	17.06%	\$32,239,479	\$53,230,187	-\$172,026,898	\$259,151,558	-\$179,877,419	\$749,932,190
Average Fare per one-way trip (Milestone 10)	\$18.00	\$18.00	\$18.00	19,589,698	2017	17.96%	\$40,723,552	\$67,351,816	-\$204,196,643	\$307,614,279	-\$163,473,291	\$899,918,628
Average one-way trip length	20.50	20.50	20.50	20,177,389	2018	18.91%	\$44,152,804	\$73,023,347	-\$207,899,067	\$313,191,530	-\$163,746,163	\$928,916,187
Average Fare per mile	\$0.88	\$0.88	\$0.88	20,762,710	2019	19.80%	\$47,871,043	\$79,172,999	-\$211,508,259	\$318,628,631	-\$163,637,291	\$954,723,672
Annual Fare	\$1,040,234,220	\$1,040,234,220	\$1,040,234,220	21,406,191	2020	20.95%	\$51,902,289	\$85,840,090	-\$215,004,439	\$323,895,486	-\$163,102,150	\$983,365,383
Annual Fare per User	\$10,980.00	\$10,980.00	\$10,980.00	22,048,377	2021	22.05%	\$52,968,729	\$93,068,729	-\$218,365,584	\$328,958,914	-\$162,092,576	\$1,012,866,344
Annual Private Subsidy per User (\$180 per month parking cash out)	\$0.00	\$0.00	\$0.00	22,709,829	2022	23.21%	\$61,011,788	\$100,006,096	-\$221,567,437	\$333,782,377	-\$160,556,650	\$1,043,252,334
Annual Public Subsidy per User (MTA - \$180 per month (it's currently \$315))	\$0.00	\$0.00	\$0.00	23,391,123	2023	24.44%	\$66,149,622	\$109,403,452	-\$224,583,316	\$338,325,673	-\$158,433,693	\$1,074,549,904
Annual Cost per User (after user subsidies)	\$10,980.00	\$10,980.00	\$10,980.00	24,092,657	2024	25.72%	\$71,720,117	\$118,616,374	-\$227,383,890	\$342,544,627	-\$155,663,773	\$1,106,786,402
Average Cost per one-way trip (after fare subsidies)	\$18.00	\$18.00	\$18.00	24,915,643	2025	27.06%	\$77,759,706	\$128,605,121	-\$229,936,951	\$346,393,710	-\$152,177,245	\$1,139,989,994
Monthly Maglev Cost per User	\$915.00	\$915.00	\$915.00	25,560,112	2026	28.50%	\$84,307,991	\$138,436,026	-\$232,207,154	\$349,810,680	-\$147,899,263	\$1,174,989,693
Monthly Maglev Cost per User (after fare subsidies)	\$915.00	\$915.00	\$915.00	26,326,915	2027	30.00%	\$91,407,503	\$151,176,923	-\$234,746,154	\$352,746,154	-\$142,748,242	\$1,209,415,384
Average round trip length (miles)	41.00	41.00	41.00	26,616,512	2028	31.50%	\$97,033,635	\$160,481,863	-\$231,658,642	\$348,984,368	-\$134,626,307	\$1,222,718,953
Annual Miles per passenger	12,505	12,505	12,505	26,909,293	2029	33.06%	\$103,006,655	\$170,359,521	-\$228,821,838	\$344,710,838	-\$125,915,783	\$1,236,168,862
Maglev User Cost per mile (after user subsidies)	\$0.88	\$0.88	\$0.88	27,205,295	2030	34.73%	\$109,346,078	\$180,845,150	-\$225,622,380	\$339,890,983	-\$129,176,302	\$1,249,766,719
Average travel speed (mph)	90	90	90	27,504,554	2031	36.47%	\$116,076,329	\$191,976,189	-\$222,035,877	\$334,488,062	-\$105,959,548	\$1,263,514,153
Average round trip time (hours)	0.46	0.46	0.46	27,807,104	2032	38.29%	\$123,220,827	\$203,792,302	-\$218,036,416	\$328,463,035	-\$94,815,588	\$1,277,412,909
Annual travel time (hours)	13,163,458	13,163,458	13,163,458	28,112,982	2033	40.20%	\$130,865,069	\$216,358,718	-\$213,596,464	\$321,774,428	-\$82,791,395	\$1,291,464,350
Annual travel distance (passenger miles)	1,184,711,195	1,184,711,195	1,184,711,195	28,422,225	2034	42.21%	\$138,856,121	\$229,651,182	-\$208,686,721	\$314,378,176	-\$69,830,651	\$1,305,670,458
				28,734,869	2035	44.32%	\$147,402,715	\$243,786,212	-\$203,276,267	\$306,227,468	-\$55,873,551	\$1,320,032,833
				29,050,953	2036	46.54%	\$156,475,353	\$258,791,253	-\$197,331,938	\$297,272,578	-\$40,856,585	\$1,334,553,194
				29,370,513	2037	48.87%	\$166,106,411	\$274,719,855	-\$190,810,720	\$287,460,678	-\$24,712,309	\$1,349,233,279
				29,693,589	2038	51.31%	\$176,330,260	\$291,628,862	-\$183,699,364	\$276,735,657	-\$17,369,104	\$1,364,074,845
				30,020,218	2039	53.89%	\$187,183,398	\$309,578,818	-\$175,934,305	\$265,037,910	\$11,249,082	\$1,379,079,668
				30,347,674	2040	56.67%	\$198,704,525	\$328,633,182	-\$167,481,516	\$252,304,128	\$31,223,007	\$1,394,249,545
Annual Cost per User	\$14,196.12	\$20,448.62	\$7,449.16	30,684,296	2041	59.40%	\$210,934,789	\$348,860,555	-\$158,296,364	\$238,467,066	\$52,338,424	\$1,409,586,290
Monthly Auto Cost per User	\$1,183.01	\$1,704.05	\$620.76	31,021,823	2042	62.37%	\$223,917,825	\$370,332,922	-\$148,331,435	\$223,455,303	\$75,586,390	\$1,425,091,739
Driver Cost per mile	\$1.14	\$1.64	\$0.60	31,363,063	2043	65.49%	\$238,126,913	\$388,791,257	-\$137,536,375	\$207,192,982	\$100,163,592	\$1,440,167,748
Annual Miles per Driver	12,505	12,505	12,505	31,708,075	2044	68.76%	\$252,330,400	\$417,323,875	-\$125,857,705	\$189,598,539	\$142,672,695	\$1,456,616,193
Annual travel distance (total miles)	1,184,711,195	1,184,711,195	1,184,711,195	32,056,845	2045	72.20%	\$267,861,336	\$443,010,159	-\$113,238,630	\$170,589,412	\$154,628,972	\$1,472,638,972
Average travel speed (mph)	30	30	30	32,409,470	2046	75.81%	\$284,348,201	\$470,277,434	-\$99,618,828	\$150,071,732	\$184,729,373	\$1,488,838,000
Average round trip time (hours)	1.37	1.37	1.37	32,765,915	2047	79.60%	\$301,840,833	\$499,223,011	-\$84,934,241	\$127,948,997	\$216,915,992	\$1,505,215,218
Annual non-productive auto travel time (hours)	39,490,373	39,490,373	39,490,373	33,126,400	2048	80.00%	\$306,707,529	\$507,257,292	-\$84,180,411	\$126,814,382	\$222,527,407	\$1,521,272,586
Annual Delay (Hours) (Auto travel vs Maglev)	26,326,915	26,326,915	26,326,915	33,490,791	2049	80.00%	\$310,081,604	\$512,837,381	-\$85,106,396	\$128,209,340	\$224,975,209	\$1,538,512,084
Value of time savings	\$19.14	\$19.14	\$19.14	33,859,189	2050	80.00%	\$318,462,502	\$518,478,572	-\$86,042,566	\$129,619,643	\$227,449,336	\$1,555,435,717
Annual Cost of Delay Time (\$25/hr)	\$503,923,077	\$503,923,077	\$503,923,077	34,231,641	2051	80.00%	\$318,460,919	\$524,181,837	-\$86,989,034	\$131,045,459	\$229,951,885	\$1,572,545,510
Annual Cost of non-productive Auto Travel Time	\$987,259,329	\$987,259,329	\$987,259,329	34,608,189	2052	80.00%	\$320,427,270	\$529,947,837	-\$87,045,914	\$132,486,959	\$232,481,366	\$1,589,843,510
Total Cost (with delay cost)	\$1,848,848,975	\$2,441,204,572	\$1,209,649,088	34,988,879	2053	80.00%	\$323,951,969	\$536,777,263	-\$88,913,319	\$133,944,316	\$235,038,651	\$1,607,331,789
Delta	\$328,612,725	\$1,400,970,352	\$169,414,866	35,373,756	2054	80.00%	\$327,515,441	\$541,670,913	-\$89,891,365	\$135,417,703	\$237,624,076	\$1,625,912,439
Total Cost (with auto drive time cost)	\$2,332,185,227	\$2,924,540,824	\$1,692,985,341	35,762,668	2055	80.00%	\$331,118,111	\$547,629,192	-\$90,880,170	\$136,907,298	\$240,237,941	\$1,642,087,576
Delta	\$1,291,951,007	\$1,884,306,604	\$652,751,121	36,156,259	2056	80.00%	\$334,760,410	\$553,653,113	-\$91,879,852	\$138,413,278	\$242,880,558	\$1,660,959,339
Annual Cost per User (including cost of congestion delay time)	\$19,515	\$28,417.60	\$12,788	36,553,978	2057	80.00%	\$338,442,775	\$559,743,297	-\$92,890,530	\$139,935,924	\$245,252,244	\$1,679,229,892
Annual Cost per User (including cost of non-productive drive time)	\$24,617	\$36,170	\$17,870	36,956,072	2058	80.00%	\$342,165,645	\$565,900,473	-\$93,912,326	\$141,476,118	\$248,263,319	\$1,697,701,420
Driver cost per mile (including cost of non-productive drive time)	\$1.97	\$1.97	\$1.43	37,362,589	2059	80.00%	\$345,929,467	\$572,125,379	-\$94,945,362	\$143,031,345	\$250,984,106	\$1,716,376,136
Monthly operating cost savings per Maglev User	\$268	\$789	-\$294	37,773,577	2060	80.00%	\$349,734,692	\$578,418,758	-\$95,989,761	\$144,604,689	\$253,744,931	\$1,735,256,274
Monthly Savings per user, including value of delay time	\$711	\$1,233	\$140	38,189,095	2061	80.00%	\$353,548,364	\$584,181,364	-\$97,045,648	\$146,195,341	\$256,336,125	\$1,754,344,093
Monthly Savings per user, including value of travel time	\$1,136	\$1,657	\$574	38,609,166	2062	80.00%	\$357,471,173	\$591,213,959	-\$98,113,150	\$147,803,490	\$259,358,022	\$1,773,641,878
Annual Savings per Maglev user	\$3,216	\$9,469	-\$3,531									
Annual Savings per user, including delay time	\$8,535	\$14,788	\$1,788									
Annual Savings per user, including non-productive to productive travel time	\$13,637	\$19,889	\$6,898									
Total Annual Operating cost savings	\$304,691,678	\$897,027,275	-\$334,508,208		1,430,463,885 total		Total (2007's)	\$9,389,054,293	\$15,528,356,934	-\$7,867,539,568	\$11,852,129,923	\$1,521,514,726
Total Annual Savings, including value of delay time	\$808,614,755	\$1,400,970,352	\$169,414,866				Total (2007's)	\$1,521,814,726				
Total Annual Savings, including value of travel time	\$1,291,951,007	\$1,884,306,604	\$652,751,121				Total (2007's)	\$27,380,486,857				
Assuming User Fare Subsidies												
Annual Savings per Maglev user with subsidies	\$3,216	\$9,469	-\$3,531									
Annual Savings per user, including delay time	\$8,535	\$14,788	\$1,788									
Annual Savings per user, including non-productive to productive travel time	\$13,637	\$19,889	\$6,898									

78,726 daily person-hour reduction in delay in 2035

The median household income of \$42,148 was reported by the U.S. Census and using 2000 hours per year as specified in the departmental guidance, the hourly value of time in year 2000 was calculated at:
FTA total value of time saved by new start project users
The median income for a household in LA County was \$56,361
The median income for Orange County QL cities was
Source: wikipedia

Median Household Income	in 2000
Irvine: \$85,624	
La Palma: \$68,438	
West Garden Grove: \$66,830	
Orange: \$64,337	
Orange: \$59,904	
Tustin: \$56,985	
Los Alamitos: \$55,286	
Buenos Aires: \$50,338	
Westminster: \$49,450	
Garden Grove: \$47,754	
Anaheim: \$47,122	
Santa Ana: \$43,412	
Stanton: \$39,127	
Total	\$732,695.00
Average for all households	\$56,361.15
Average for Orangeline Maglev Users	\$70,451.44

Calculation of Value of time based on FTA Guidance

	National Average	Orange County	Household Income	LA
--	------------------	---------------	------------------	----

Automobile Driving Costs, 2005

CATEGORY		SMALL CAR	MIDSIZE CAR	LARGE CAR	SPORT UTILITY VEHICLE	VAN							
OPERATING COSTS (cents per mile)													
Gasoline & Oil		6.9	8.5	9.3	10.8	8.9	0.09	\$0.16	\$3.50 gallon (Observed)				
Maintenance		4.7	5.8	5.4	5.3	5.7	0.06	\$0.10	21.4 miles per gallon (AAA)				
Tires		0.5	0.7	0.5	0.9	0.6	0.01	\$0.01	25.68 passenger miles per gallon (1.2 pass per vehicle)				
SUBTOTAL		12.1	15	15.2	17	15.2	0.16	\$0.27					
OWNERSHIP COSTS (cost per year, dollars)													
Insurance		1,456	1,195	1,212	1,398	1,130	0.11						
License, registration, taxes		333	390	445	435	389	0.03						
Depreciation (15,000 miles annually)		2,985	4,005	4,647	4,300	3,755	0.34						
Finance charge (10% down; loan @ 6%/5 yrs.)		553	740	925	891	739	0.07						
SUBTOTAL		5,327	6,330	7,229	7,024	6,013	0.51						
DEPRECIATION ADJUSTMENTS (dollars)													
(mileage under 15,000 miles annually)		-550	-925	-1,175	-950	-925		\$0.08					
(mileage over 15,000 miles annually)		650	950	1,175	925	950							
TOTAL ANNUAL COST (dollars)													
10,000 miles per year		5,987	6,905	7,574	7,774	6,608			\$0.60	Marginal Cost Savings from not driving but retaining auto ownership			
15,000 miles per year		7,142	8,580	9,509	9,574	8,293							
20,000 miles per year		8,397	10,280	11,444	11,349	10,003							
TOTAL ANNUAL COST WITH PARKING (\$10 dollars/day)													
10,000 miles per year	\$10.00 per day	9,637	10,555	11,224	11,424	10,258		\$0.24					
15,000 miles per year		10,792	12,230	13,159	13,224	11,943							
20,000 miles per year		12,047	13,930	15,094	14,999	13,653							
TOTAL COST PER MILE (dollars)													
						1.069			2007\$				
10,000 miles per year	10000	0.60	0.69	0.76	0.78	0.66	0.64	0.74	0.81	0.83	0.71	0.75	
15,000 miles per year	15000	0.48	0.57	0.63	0.64	0.55	0.51	0.61	0.68	0.68	0.59	0.61	
20,000 miles per year	20000	0.42	0.51	0.57	0.57	0.50	0.45	0.55	0.61	0.61	0.53	0.55	
TOTAL COST PER MILE WITH PARKING (\$10 dollars/day)													
10,000 miles per year	10000	0.96	1.06	1.12	1.14	1.03	1.03	1.13	1.20	1.22	1.10	1.14	
15,000 miles per year	15000	0.72	0.82	0.88	0.88	0.80	0.77	0.87	0.94	0.94	0.85	0.87	
20,000 miles per year	20000	0.60	0.70	0.75	0.75	0.68	0.64	0.74	0.81	0.80	0.73	0.75	
TOTAL EXPRESS LANE COST PER MILE (\$5.00 toll) WITH PARKING (\$10 dollars/day)													
10,000 miles per year	10000						1.53	1.63	1.70	1.72	1.60	1.64	
15,000 miles per year	15000						1.27	1.37	1.44	1.44	1.35	1.37	
20,000 miles per year	20000						1.14	1.24	1.31	1.30	1.23	1.25	

Source: American Automobile Association and Runzheimer International, Your Driving Costs, 2005 Edition. Data for a popular model of each type listed assuming ownership of more than 5 years or 75,000 miles before replacement

Source: Orange County Register

Source www.vtpi.org/tca/tca0504.pdf (parking costs)

Toll Lane Charges in Orange County

			41.66	305	12,706
			mi per day	days	miles
Toll Road	73	241			
Peak Charge	\$4.57	\$5.25			
Length (miles)	16	25			
Cost per mile	\$0.29	\$0.21	\$0.95	\$0.48	

Station-area Improvements and Feeder Services by Cities					
Potential Allocations to Member Cities (2007 Dollars)			Total Expenses	2027 Expenses	2037 Expenses
Assumed Fare (2007\$) = \$18.00			With Station Area Development - to 2064	With Station Area Development - to 2064	With Station Area Development - to 2064
Cities	Population, 2000 (some 2001-2005)	3% Discount	3% Discount	3% Discount	3% Discount
Member Cities	Artesia	16,380	\$115,468,357	\$517,271	\$1,462,376
	Bell	36,664	\$258,457,377	\$1,157,828	\$3,273,294
	Bellflower	74,900	\$527,996,332	\$2,365,298	\$6,686,933
	Cerritos	51,488	\$362,956,944	\$1,625,961	\$4,596,753
	Cudahy	24,200	\$170,594,275	\$764,222	\$2,160,531
	Downey	110,600	\$779,658,135	\$3,492,684	\$9,874,163
	Huntington Park	61,348	\$432,463,537	\$1,937,334	\$5,477,036
	Los Alamitos	11,500	\$81,067,528	\$363,163	\$1,026,699
	Maywood	28,083	\$197,966,902	\$886,845	\$2,507,198
	Palmdale	121,400	\$855,791,117	\$3,833,741	\$10,838,367
	Paramount	55,266	\$389,589,389	\$1,745,268	\$4,934,046
	Santa Clarita	155,100	\$1,093,354,219	\$4,897,968	\$13,847,040
	South Gate	99,800	\$703,525,152	\$3,151,626	\$8,909,959
	Vernon	91	\$641,491	\$2,874	\$8,124
Total Member Cities		846,820	\$5,969,530,755	\$26,742,084	\$75,602,518
Prospective LA County Cities	Burbank	102,400	\$721,853,463	\$3,233,733	\$9,142,082
	Glendale	199,000	\$1,402,820,694	\$6,284,304	\$17,766,351
	City of LA (portion)	1,000,000	\$7,049,350,222	\$31,579,419	\$89,278,144
	San Fernando	23,564	\$166,110,889	\$744,137	\$2,103,750
	County Unincorporated (portion)	50,000	\$352,467,511	\$1,578,971	\$4,463,907
Total LA County		2,210,284	\$15,581,066,006	\$69,799,485	\$197,330,054
Prospective Orange County Cities	La Palma	0	\$0	\$0	\$0
	Cypress	0	\$0	\$0	\$0
	Buena Park	0	\$0	\$0	\$0
	Stanton	0	\$0	\$0	\$0
	Anaheim	0	\$0	\$0	\$0
	Garden Grove	0	\$0	\$0	\$0
	Santa Ana	0	\$0	\$0	\$0
	Orange	0	\$0	\$0	\$0
	Tustin	0	\$0	\$0	\$0
	Irvine	0	\$0	\$0	\$0
Total OC cities		11,500	\$81,067,528	\$363,163	\$1,026,699
Total Cities		2,221,784	\$15,662,133,533	\$70,162,648	\$198,356,753
California		33,871,648			

Savings in Gasoline Consumption

		Power Requirement	Miles Saved	Year	Annual Emission Savings in tons			Energy Savings
					CO	NOX	CO2	Gallons of Gasoline
Average Trip Length (miles)	20.50							
Drivers in 2027	94,739		425,123,645	2013	9,778	650	194,707	12,303,423
Average round trip	41		510,148,374	2014	11,733	780	233,648	14,764,107
Annual Miles Saved/driver	12,505		612,178,049	2015	14,080	935	280,378	17,716,929
Passenger Miles per Gallon average	25.68	312	734,613,659	2016	16,896	1,122	336,453	21,260,314
Annual Gallons Saved	46,133,614	vehicle trips/day	881,536,391	2017	20,275	1,347	403,744	25,512,377
Average Cost per Gallons	\$3.50	12	907,982,483	2018	20,884	1,387	415,856	26,277,748
Annual cost saved	\$161,467,647	MWH/vehicle trip	935,221,957	2019	21,510	1,429	428,332	27,066,081
			963,278,616	2020	22,155	1,472	441,182	27,878,063
			992,176,975	2021	22,820	1,516	454,417	28,714,405
Maglev Users		3,744	1,021,942,284	2022	23,505	1,562	468,050	29,575,837
Passenger Miles per gallon	100 from TRI	MWH/day	1,052,600,552	2023	24,210	1,608	482,091	30,463,113
Annual Gallons used	11,847,112		1,084,178,569	2024	24,936	1,657	496,554	31,377,006
Average Cost per Gallons	\$3.50	1,530,547	1,116,703,926	2025	25,684	1,706	511,450	32,318,316
Annual cost	\$41,464,892	MWH/year	1,150,205,044	2026	26,455	1,758	526,794	33,287,866
			1,184,711,195	2027	27,248	1,810	542,598	34,286,502
Net cost savings per year	\$120,002,755		1,197,743,018	2028	27,548	1,830	548,566	34,663,653
Net gallons of gas saved per year	34,286,502		1,210,918,191	2029	27,851	1,850	554,601	35,044,953
			1,224,238,291	2030	28,157	1,871	560,701	35,430,448
			1,237,704,913	2031	28,467	1,891	566,869	35,820,183
			1,251,319,667	2032	28,780	1,912	573,104	36,214,205
			1,265,084,183	2033	29,097	1,933	579,409	36,612,561
			1,279,000,109	2034	29,417	1,954	585,782	37,015,299
			1,293,069,110	2035	29,741	1,976	592,226	37,422,467
			1,307,292,870	2036	30,068	1,998	598,740	37,834,115
			1,321,673,092	2037	30,398	2,020	605,326	38,250,290
			1,336,211,496	2038	30,733	2,042	611,985	38,671,043
			1,350,909,822	2039	31,071	2,064	618,717	39,096,424
			1,365,769,831	2040	31,413	2,087	625,523	39,526,485
			1,380,793,299	2041	31,758	2,110	632,403	39,961,276
			1,395,982,025	2042	32,108	2,133	639,360	40,400,851
			1,411,337,827	2043	32,461	2,157	646,393	40,845,260
			1,426,862,543	2044	32,818	2,180	653,503	41,294,558
			1,442,558,031	2045	33,179	2,204	660,692	41,748,798
			1,458,426,170	2046	33,544	2,228	667,959	42,208,035
			1,474,468,858	2047	33,913	2,253	675,307	42,672,323
			1,490,688,015	2048	34,286	2,278	682,735	43,141,719
			1,507,085,583	2049	34,663	2,303	690,245	43,616,277
			1,523,663,525	2050	35,044	2,328	697,838	44,096,057
			1,540,423,823	2051	35,430	2,354	705,514	44,581,113
			1,557,368,485	2052	35,819	2,380	713,275	45,071,505
			1,574,499,539	2053	36,213	2,406	721,121	45,567,292
			1,591,819,034	2054	36,612	2,432	729,053	46,068,532
			1,609,329,043	2055	37,015	2,459	737,073	46,575,286
			1,627,031,662	2056	37,422	2,486	745,181	47,087,614
			1,644,929,011	2057	37,833	2,513	753,377	47,605,578
			1,663,023,230	2058	38,250	2,541	761,665	48,129,239
			1,681,316,485	2059	38,670	2,569	770,043	48,658,661
			1,699,810,967	2060	39,096	2,597	778,513	49,193,906
			1,718,508,887	2061	39,526	2,626	787,077	49,735,039
			1,737,412,485	2062	39,960	2,655	795,735	50,282,125

Annual Reduction in Air Pollution

Reduction in auto travel (total miles saved in 2027)	1,184,711,195								
AQMD RECLAIM Calculation for NOx only									
Vehicle miles per year**	12500								
Vehicle Emissions per year**	lbs/12500 mi	lbs	tons	Value***					
Hydrocarbons	77.1	7,307,299	3,654	\$14,614,597	1,336,211,496	2038	30,733	2,042	
Carbon Monoxide	575	54,496,715	27,248	\$108,993,430	1,350,909,822	2039	31,071	2,064	
Nitrogen Oxides***	38.2	3,620,477	1,810	\$7,240,955	1,365,769,831	2040	31,413	2,087	
Carbon Dioxide***	11450	1,085,195,455	542,598	\$73,793,291	1,380,793,299	2041	31,758	2,110	
Total Emissions		1,150,619,946	575,310	\$81,034,246	1,395,982,025	2042	32,108	2,133	
Gasoline (gallons/12500 miles)	487				1,411,337,827	2043	32,461	2,157	
					1,426,862,543	2044	32,818	2,180	
					1,442,558,031	2045	33,179	2,204	
					1,458,426,170	2046	33,544	2,228	
					1,474,468,858	2047	33,913	2,253	
					1,490,688,015	2048	34,286	2,278	
					1,507,085,583	2049	34,663	2,303	
					1,523,663,525	2050	35,044	2,328	
					1,540,423,823	2051	35,430	2,354	
					1,557,368,485	2052	35,819	2,380	
					1,574,499,539	2053	36,213	2,406	
					1,591,819,034	2054	36,612	2,432	
					1,609,329,043	2055	37,015	2,459	
					1,627,031,662	2056	37,422	2,486	
					1,644,929,011	2057	37,833	2,513	
					1,663,023,230	2058	38,250	2,541	
					1,681,316,485	2059	38,670	2,569	
					1,699,810,967	2060	39,096	2,597	
					1,718,508,887	2061	39,526	2,626	
					1,737,412,485	2062	39,960	2,655	
* Source	www.arb.ca.gov/html/brochure/history.htm								
	280 billion miles per year travel in California								
	1.2 million tons of NOx + Hydrocarbons per year in California								
	0.0000042857 tons per mile NOx + Hydrocarbons per year in California								
** Source	www.epa.gov/otaq/consumer/f00013.htm								
	Values for emissions are for one year based upon annual average 12,500 miles driven				64,370,874,841	Total	1,480,530	98,359	29,481,861
***Sources	www.aqmd.gov/reclaim/rtc_main.html					Value		\$393,434,787	\$4,009,533,052
	\$2 per pound of NOx emission on the Reclaim Trading Credit Market					Tons per day	81	5	1,615
	Values for other pollutants are illustrative only								102,079
	http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/05/84&format=HTML&aged=1&language=EN&language=en								
	\$0.068 per pound of CO2 emission on the EETNAP (European Emissions Trading and National Allocation Plans) (EU100 per ton)								
****Source	The Orange County Register - May 25, 2007								
	111.5 tons per day of diesel emissions in California		40,697.5 per year						
	5 tons per day of diesel particulate matter								
	34.6 tons per day from heavy duty diesel trucks		12,629 per year						

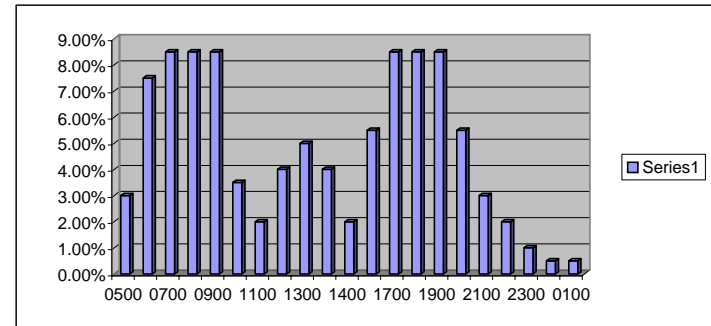
Theoretical Operational Capacity (in year 2062)

seated passengers per vehicle	1,000	1,000
service frequency (minutes)	5.0	2.0
vehicle trips per hour (two directions)	24	60
hours per day	20	20
vehicle trips per day	480	1,200
passenger trips per vehicle trip	1,500	1,500
passenger trips per hour (Capacity)	36,000	90,000
passenger trips per day (Capacity)	720,000	1,800,000
passenger trips per year	219,600,000	549,000,000
average fare per passenger trip	\$18.00	\$18.00
passenger fares per year	\$3,952,800,000	\$9,882,000,000

Projected Operational Demand/Usage (in year 2062)

projected daily riders	277,875	277,875
projected utilization (ridership)	39%	15%
projected fares per year	\$6,999,164,880	\$6,999,164,880
projected fares ratio (demand / capacity)	177%	71%
maximum passengers on-board/capacity	66%	26% (assumes equal distribution)

Time of Day	Percent of Daily Riders	In-vehicle	% Capacity
0500	3.00%	8,336	23%
0600	7.50%	20,841	58%
0700	8.50%	23,619	66%
0800	8.50%	23,619	66%
0900	8.50%	23,619	66%
1000	3.50%	9,726	27%
1100	2.00%	5,557	15%
1200	4.00%	11,115	31%
1300	5.00%	13,894	39%
1400	4.00%	11,115	31%
1400	2.00%	5,557	15%
1600	5.50%	15,283	42%
1700	8.50%	23,619	66%
1800	8.50%	23,619	66%
1900	8.50%	23,619	66%
2000	5.50%	15,283	42%
2100	3.00%	8,336	23%
2200	2.00%	5,557	15%
2300	1.00%	2,779	8%
2400	0.50%	1,389	4%
0100	0.50%	1,389	4%
	100.00%	277,875	



Calculations for FTA Benefits Criteria

Summary Description	
Proposed Project:	Orangeline Corridor Development Project Orangeline High Speed Maglev 80 miles, 12 stations
Total Capital Cost (\$2007):	\$14,242,962,963
Section 5309 Share:	\$0
Annual Operating Cost in 2027 (\$2007):	\$259,331,111
Ridership Forecast (2027):	189,478 daily boardings 189,478 daily new riders
FY 2007 Financial Rating:	High
FY 2007 Project Justification Rating:	High
FY 2007 Overall Project Rating:	Highly Recommended

Mobility Improvements	New Start vs. No-Build	New Start vs. TSM
Annual Travel Time Savings in 2027 (Million Hours)	N/A	26
Total Travel Time Savings Over 50 years (Million Hours)	N/A	1,430

Air Quality Improvements	New Start vs. No-Build	New Start vs. TSM	New Start vs. TSM	New Start vs. TSM
Criteria Pollutant		In 2027	Over 50 Years	Over 50 Years
Carbon Monoxide (CO)	N/A	27,248	1,480,530	N/A
Nitrogen Oxide (NO_x)	N/A	1,810	98,359	\$393,434,787
Volatile Organic Compounds (VOC)	N/A	N/A	N/A	N/A
Particulate Matter (PM₁₀)	N/A	N/A	N/A	N/A
Carbon Dioxide (CO₂)	N/A	542,598	29,481,861	\$4,009,533,052

Values reflect annual tons of emissions reductions and dollar values based upon emission credits trading

Energy Savings	New Start vs. No-Build	New Start vs. TSM
Gallons of Gasoline (million) In 2027	N/A	34
Gallons of Gasoline (million) Over 50 years	N/A	1,863

Operating Efficiencies	No-Build	TSM	New Start
System Capital + Operating Cost per Passenger Mile (2027)	N/A	\$1.14	\$0.62

Values reflect 2027 ridership forecast and 2007 dollars.

Economic Efficiencies	New Start vs. No-Build	New Start vs. TSM
Incremental Cost per Incremental Passenger	N/A	\$0.00

Values reflect 2027 ridership forecast and 2007 dollars. () indicates income.

Economic Benefits	New Start vs. No-Build	New Start vs. TSM
Project Surplus	N/A	\$17,276,873,265
Operating Reserves	N/A	\$1,484,203,996
Station-area Improvements/Feeder Services	N/A	\$15,662,133,533
Investor Earnings	N/A	\$17,440,820,412
User Cost Savings	N/A	\$1,521,514,726
User Delay Savings	N/A	\$27,380,486,857
Total Project Benefits	N/A	\$72,721,826,749
Project Cost	N/A	\$16,810,221,511
Benefit/Cost Ratio	N/A	4.33
Emission Savings	N/A	\$4,402,967,839
Benefit/Cost Ratio	N/A	4.59

Values reflect 50-year ridership cost and revenue projections and 2007 dollars.